

REMARKS

Claims 1-11 remain in the application and have been amended hereby.

Reconsideration is respectfully requested of the rejection of claims 1-11 under 35 USC 112, second paragraph, as being indefinite.

Independent claims 1 and 9-11 have been amended to clarify that a communication device (1_{k+1} in Figs. 1 and 2) communicates with a plurality of communication terminals (1_1 to 1_k in Fig. 1) in a multiple-access communication system.

Further, independent claims 1 and 9-11 have been amended to clarify that the received signal ($r(t)$ in Fig. 3) includes a plurality of signals respectively transmitted from the plurality of communication terminals (1_1 to 1_k in Fig. 1).

Furthermore, independent claims 1 and 9-11 have been amended to clarify that the plurality of communication terminals transmit the plurality of signals using ultra-wideband (UWB) communication waveforms and that a correlation of the received signal is calculated with respect to pulses at possible positions in the respective signals transmitted from each of the plurality of communication terminals. See Fig. 4B of the present application, for example, showing a pulse position

modulation method. See also the last paragraph of page 13 of the present application.

Moreover, Fig. 3 shows the correlation calculation means (21) and the demodulation means (22) of the communication device 1_{k+1} .

Accordingly, it is respectfully submitted that amended independent claims 1 and 9-11, and the claims depending therefrom, are clear and definite in their recitation of the present invention and meet all requirements of 35 USC 112.

Reconsideration is respectfully requested of the rejection of claims 1, 4-6, and 9-11 under 35 USC 102(e), as being anticipated by Grabb et al.

As discussed above, a feature of the present invention is to demodulate data transmitted from each of a plurality of communication terminals based on a calculated correlation and a multiple-access interference among a plurality of signals transmitted from the plurality of communication terminals.

Independent claims 1 and 9-11 have been amended to recite this feature of the present invention.

Looking at Grabb et al. we see that there is no demodulation based on a multiple-access interference among a plurality of signals transmitted from a plurality of communication terminals. Grabb et al. is merely disclosing

a standard receiver wherein one signal is transmitted to a plurality of nodes.

Accordingly, it is respectfully submitted that amended independent claims 1 and 9-11, and the claims depending therefrom, are not anticipated by Grabb et al.

Reconsideration is respectfully requested of the rejection of claims 1 and 9-11 under 35 USC 102(e), as being anticipated by Evans et al.


Looking at Evans et al. we see that there is no demodulation based on a multiple-access interference among a plurality of signals transmitted from a plurality of communication terminals. Evans et al. is merely disclosing a system wherein one station (60) is connected to an Ethernet (51) via a wireless UWB.

Accordingly, it is respectfully submitted that amended independent claims 1 and 9-11 are not anticipated by Evans et al.

Applicants acknowledge the Examiner's finding of Allowable Subject Matter in claims 2, 3, 7, and 8.

Favorable reconsideration is respectfully requested.

Respectfully submitted,
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VERSION WITH MARKINGS TO SHOW CHANGES MADEIN THE CLAIMS

Please amend claims 1-11 by rewriting same to read as follows:

--1. (Amended) A communication device for communicating with a plurality of communication terminals in a multiple-access communication system, comprising:

correlation calculation means for calculating [the] a correlation [between] of a received signal [corresponding to] including a plurality of signals respectively transmitted from [a] the plurality of communication terminals [by means of UWB (Ultra WideBand)] using ultra-wideband (UWB) communication [and] waveforms with respect to pulses at possible positions in [a signal] the respective signals transmitted from each of the plurality of communication [terminal] terminals; and

demodulation means for demodulating data transmitted from [the respective] each of the plurality of communication terminals based on the [basis of the] calculated correlation[, taking into account] and a multiple-access interference among the plurality of signals transmitted from the plurality of communication terminals.

--2. (Amended) [A] The communication device according to Claim 1, wherein the plurality of signals transmitted from the plurality of communication terminals are generated by modulating data by means of M-ary pulse position modulation.

--3. (Amended) [A] The communication device according to Claim 1, wherein the plurality of signals transmitted from the plurality of communication terminals are generated by modulating data by means of M-ary orthogonal modulation.

--4. (Amended) [A] The communication device according to Claim 1, wherein the demodulation means demodulates data by detecting one of an optimum symbol [or] and an optimum symbol sequence based on the [basis of the] calculated correlation[, taking into account] and the multiple-access interference among the plurality of signals transmitted from the plurality of communication terminals.

--5. (Amended) [A] The communication device according to Claim 4, wherein the demodulation means detects [an] one of the optimum symbol [or an] and the optimum symbol sequence by means of maximum-likelihood estimation [on the

basis of] based on the correlation, a correlation matrix indicating the correlation among the pulses at possible positions in the respective transmitted signals, the energy of the respective transmitted signals, and the possible pulse positions.

--6. (Amended) [A] The communication device according to Claim 1, wherein the demodulation means demodulates data by detecting one of a suboptimum symbol [or] and a suboptimum symbol sequence based on the [basis of the] calculated correlation[, taking into account] and the multiple-access interference among the plurality of signals transmitted from the plurality of communication terminals.

--7. (Amended) [A] The communication device according to Claim 6, wherein the demodulation means comprises:

conversion means for making a conversion of the calculated correlation using [the] an inverse matrix of [the] a correlation matrix indicating the correlation among the pulses at possible positions in the respective transmitted signals; and

detection means for detecting [a] one of the suboptimum symbol [or a] and the suboptimum symbol sequence based on [the basis of] the output of the conversion means.

--8. (Amended) [A] The communication device according to Claim 6, wherein the demodulation means converts the calculated correlation such that [the] a mean square error becomes minimum and detects one of the suboptimum symbol [or] and the suboptimum symbol sequence based on [the basis of] the converted correlation.

--9. (Amended) A method of communication for communicating with a plurality of communication terminals in a multiple-access communication system, comprising the steps of:

calculating [the] a correlation [between] of a received signal [corresponding to] including a plurality of signals respectively transmitted from [a] the plurality of communication terminals [by means of UWB (Ultra WideBand)] using ultra-wideband (UWB) communication [and] waveforms with respect to pulses at possible positions in [a signal] the respective signals transmitted from each of the plurality of communication [terminal] terminals; and

demodulating data transmitted from [the respective] each of the plurality of communication terminals based on the [basis of the] calculated correlation[, taking into account] and a multiple-access interference among the

plurality of signals transmitted from the plurality of communication terminals.

--10. (Amended) A program used by a computer to perform communication with a plurality of communication terminals in a multiple-access communication system, the program comprising the steps of:

calculating [the] a correlation [between] of a received signal [corresponding to] including a plurality of signals respectively transmitted from [a] the plurality of communication terminals [by means of UWB (Ultra WideBand)] using ultra-wideband (UWB) communication [and] waveforms with respect to pulses at possible positions in [a signal] the respective signals transmitted from each of the plurality of communication [terminal] terminals; and

demodulating data transmitted from [the respective] each of the plurality of communication terminals based on the [basis of the] calculated correlation[, taking into account] and a multiple-access interference among the plurality of signals transmitted from the plurality of communication terminals.

--11. (Amended) A storage medium storing a program used by a computer to perform communication with a plurality

of communication terminals in a multiple-access communication system, the program comprising the steps of:

calculating [the] a correlation [between] of a received signal [corresponding to] including a plurality of signals respectively transmitted from [a] the plurality of communication terminals [by means of UWB (Ultra WideBand)] using ultra-wideband (UWB) communication [and] waveforms with respect to pulses at possible positions in [a signal] the respective signals transmitted from each of the plurality of communication [terminal] terminals; and

demodulating data transmitted from [the respective] each of the plurality of communication terminals based on the [basis of the] calculated correlation[, taking into account] and a multiple-access interference among the plurality of signals transmitted from the plurality of communication terminals.--